

*Blue*

**Work Order ID 58346**

May 3, 2010 3:07:54 PM

Page 1

Item ID: D206-667-203TRN

Accept

Setup Start

Revision ID:

Stop

Item Name: Crosstube Turning Detail

Start Date: 5/03/10 Start Qty: 1.00

Cust Item ID:

Required Date: 5/06/10 Req'd Qty: 1.00

Customer:

Reference:

Approvals: Process Plan:

Date:

Tooling:

Date:

Run Start

QC:

Date:

SPC (Y/N):

Date:

Stop

Sequence ID/  
Work Center ID

Operation  
Description

Set Up/  
Run Hours

Draw  
Number

Draw  
Rev.

Plan  
Code

Accept  
Qty

Reject  
Qty

Reject  
Number

Insp.  
Stamp

Draw Nbr

Revision Nbr

D206-667-243

Rev C

100

0.00



Mori Seiki

Mori Seiki CNC Lathe Large

MORI SEIKI CNC LATHE LARGE

Memo

0.00

1-Fill tube with sand & install plugs DT8534 on both ends as per Folio FA089  
12-Turn first side as per Folio FA089 13-File down transition lines smooth.

*Q.M. 10-05-050*

110

0.00



QC

Quality Control

QC1- Inspect dimensions to dimension sheet

Memo

0.00

*Q.M. 10-05-050*

120

0.00



Mori Seiki

Mori Seiki CNC Lathe Large

MORI SEIKI CNC LATHE LARGE

Memo

0.00

1-Turn second side as per Folio FA089 12-File down transition lines smooth.  
3-Remove sand and plugs 4-Scrib part# and batch #

*Q.M. 10-05-050*

| W/O: |      | WORK ORDER CHANGES |    |      |     |                                     |                          |
|------|------|--------------------|----|------|-----|-------------------------------------|--------------------------|
| DATE | STEP | PROCEDURE CHANGE   | By | Date | Qty | Approval<br>Chief Eng /<br>Prod Mgr | Approval<br>QC Inspector |
|      |      |                    |    |      |     |                                     |                          |
|      |      |                    |    |      |     |                                     |                          |

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

Resolution: \_\_\_\_\_ Disposition: \_\_\_\_\_ QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

| NCR: |      | WORK ORDER NON-CONFORMANCE (NCR) |                                |                                 |                |                           |                       |                          |
|------|------|----------------------------------|--------------------------------|---------------------------------|----------------|---------------------------|-----------------------|--------------------------|
| DATE | STEP | Description of NC<br>Section A   | Corrective Action<br>Section B |                                 |                | Verification<br>Section C | Approval<br>Chief Eng | Approval<br>QC Inspector |
|      |      |                                  | Initial<br>Chief Eng           | Action Description<br>Chief Eng | Sign &<br>Date |                           |                       |                          |
|      |      |                                  |                                |                                 |                |                           |                       |                          |
|      |      |                                  |                                |                                 |                |                           |                       |                          |
|      |      |                                  |                                |                                 |                |                           |                       |                          |

**NOTE:** Date & initial all entries

**Work Order ID 58346**

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Page 2

Item ID: D206-667-203TRN

Accept



Setup Start



Revision ID:

Stop



Item Name: Crosstube Turning Detail

Start Date: 5/03/10 Start Qty: 1.00



Cust Item ID:

Required Date: 5/06/10 Req'd Qty: 1.00



Customer:

Reference:

Run Start



Approvals: Process Plan:

Date:

Tooling:

Date:

Stop



QC:

Date:

SPC (Y/N):

Date:

Sequence ID/  
Work Center IDOperation  
DescriptionSet Up/  
Run HoursDraw  
NumberDraw  
Rev.Plan  
CodeAccept  
QtyReject  
QtyReject  
NumberInsp.  
Stamp

130

QC1- Inspect dimensions to dimension sheet

0.00



QC

Memo

0.00

Quality Control

a.m. 10 - 05 - 05 @

140

QC8- Inspect parts - second check

0.00



QC

Memo

0.00

Quality Control

(IX) Q MB 10-05-06

150

Crosstubes Chemical Conversion

0.00



HandFXtube

Memo

0.00

Hand Finishing Crosstubes

(IX) Q MB 10-05-06

| W/O: |      | WORK ORDER CHANGES |    |      |     |                                     |                          |
|------|------|--------------------|----|------|-----|-------------------------------------|--------------------------|
| DATE | STEP | PROCEDURE CHANGE   | By | Date | Qty | Approval<br>Chief Eng /<br>Prod Mgr | Approval<br>QC Inspector |
|      |      |                    |    |      |     |                                     |                          |
|      |      |                    |    |      |     |                                     |                          |

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

Resolution: \_\_\_\_\_ Disposition: \_\_\_\_\_ QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

| NCR: |      | WORK ORDER NON-CONFORMANCE (NCR) |                             |                                 |                |                           |                       |                          |
|------|------|----------------------------------|-----------------------------|---------------------------------|----------------|---------------------------|-----------------------|--------------------------|
| DATE | STEP | Description of NC<br>Section A   | Corrective Action Section B |                                 |                | Verification<br>Section C | Approval<br>Chief Eng | Approval<br>QC Inspector |
|      |      |                                  | Initial<br>Chief Eng        | Action Description<br>Chief Eng | Sign &<br>Date |                           |                       |                          |
|      |      |                                  |                             |                                 |                |                           |                       |                          |
|      |      |                                  |                             |                                 |                |                           |                       |                          |
|      |      |                                  |                             |                                 |                |                           |                       |                          |

**NOTE:** Date & initial all entries

# Work Order ID 58346

May 3, 2010 3:07:55 PM



Page 3

Item ID: D206-667-203TRN

Accept



Setup Start



Revision ID:

Stop



Item Name: Crosstube Turning Detail

Start Date: 5/03/10 Start Qty: 1.00



Cust Item ID:

Required Date: 5/06/10 Req'd Qty: 1.00



Customer:

Reference:

Run Start



Approvals: Process Plan:

Date:

Tooling:

Date:

Stop



QC:

Date:

SPC (Y/N):

Date:

Sequence ID/  
Work Center ID

Operation  
Description

Set Up/  
Run Hours

Draw  
Number

Draw  
Rev.

Plan  
Code

Accept  
Qty

Reject  
Qty

Reject  
Number

Insp.  
Stamp

160

QC3- Inspect Part Finish

0.00



QC

Memo

0.00

Quality Control

Q.M 10 - 05 - 06 (1)

170

Packaging

0.00



Packaging

Memo

0.00

Packaging

Identify and Stock in kanban rack!! Location: X-tube cel

MB 10-05-06

180

QC21- Final Inspection - Work Order Release

0.00



QC

Memo

0.00

Quality Control

10/05/07  
MR  
10-5-6

# Picklist Print

May 3, 2010 3:07:52 PM

Page 1

Work Order ID: 58346



Parent Item: D206-667-203TRN



Parent Item Name: Crosstube Turning Detail

Start Date: 5/03/10

Required Date: 5/06/10

Comments: IPP Rev:A 08-03-06 new issue DD verified by:ec  
IPP Rev B 08.04.02 Removed polish EC verified by: DD  
IPP Rev C 09.01.06 ECN 08-562 EC verified by:DD

Start Qty: 1.00

Required Qty: 1.00

| Component Item ID/ | Replacement | Mfg/         | Bin | Primary | Last | Route | Unit of | Qty on  | Qty per Kit | Qty | Date | Status |
|--------------------|-------------|--------------|-----|---------|------|-------|---------|---------|-------------|-----|------|--------|
| D6004-115          |             | Manufactured | No  |         |      | 100   | Each    | 66.0000 | 1           |     |      |        |



Crosstube Material



Q. N 10-05-08②

| Location | Loc Qty | Loc Code |
|----------|---------|----------|
| LG       | 66      |          |
| 34685    | 17      |          |
| 34774    | 11      |          |
| 38336    | 38      |          |

| W/O: |      | WORK ORDER CHANGES |    |      |     |                                     |                          |
|------|------|--------------------|----|------|-----|-------------------------------------|--------------------------|
| DATE | STEP | PROCEDURE CHANGE   | By | Date | Qty | Approval<br>Chief Eng /<br>Prod Mgr | Approval<br>QC Inspector |
|      |      |                    |    |      |     |                                     |                          |
|      |      |                    |    |      |     |                                     |                          |

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

Resolution: \_\_\_\_\_ Disposition: \_\_\_\_\_ QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

| NCR: |      | WORK ORDER NON-CONFORMANCE (NCR) |                             |                                 |                |                           |                       |                          |
|------|------|----------------------------------|-----------------------------|---------------------------------|----------------|---------------------------|-----------------------|--------------------------|
| DATE | STEP | Description of NC<br>Section A   | Corrective Action Section B |                                 |                | Verification<br>Section C | Approval<br>Chief Eng | Approval<br>QC Inspector |
|      |      |                                  | Initial<br>Chief Eng        | Action Description<br>Chief Eng | Sign &<br>Date |                           |                       |                          |
|      |      |                                  |                             |                                 |                |                           |                       |                          |
|      |      |                                  |                             |                                 |                |                           |                       |                          |
|      |      |                                  |                             |                                 |                |                           |                       |                          |

**NOTE:** Date & initial all entries

|   |  |                           |
|---|--|---------------------------|
| DART AEROSPACE LTD                          |  | Work Order: <u>58746</u>  |
| Description: Crosstube Assembly             |  | Part Number: D206-667-243 |
| Inspection Dwg: D206-667-243 Rev: <u>7C</u> |  | Page 1 of 1               |

### FIRST ARTICLE INSPECTION CHECKLIST

☒ First Article
 ☐ Prototype

|        | Inspection Sheet<br>Drawing Dimension | Tolerance     | Actual<br>Dimension | Accept | Reject | Method of<br>Inspection | Comments |
|--------|---------------------------------------|---------------|---------------------|--------|--------|-------------------------|----------|
| SIDE A | 2.490                                 | +0.005/-0.000 | 2.490               | /      |        |                         |          |
|        | 2.018                                 | +0.005/-0.000 | 2.023               | /      |        |                         |          |
|        | 2.079                                 | +0.005/-0.000 | 2.084               | /      |        |                         |          |
|        | 2.145                                 | +0.005/-0.000 | 2.150               | /      |        |                         |          |
|        | 2.209                                 | +0.005/-0.000 | 2.214               | /      |        |                         |          |
|        | 2.287                                 | +0.005/-0.000 | 2.292               | /      |        |                         |          |
|        | 2.363                                 | +0.005/-0.000 | 2.367               | /      |        |                         |          |
|        | 2.433                                 | +0.005/-0.000 | 2.436               | /      |        |                         |          |
|        | 0.200                                 | +/-0.010      | 0.200               | /      |        |                         |          |
|        | 0.500 x 30°                           | +/-0.010      | 0.500 x 30°         | /      |        |                         |          |
|        | R0.063                                | +/-0.010      | R0.063              | /      |        |                         |          |
|        | R0.500                                | +/-0.010      | R0.500              | /      |        |                         |          |
|        | 4.438                                 | +/-0.030      | 4.438               | /      |        |                         |          |
|        | 104.91                                | +/-0.020      | 104.910             | /      |        |                         |          |
|        | 2.490                                 | +0.005/-0.000 | 2.490               | /      |        |                         |          |
| SIDE B | 2.018                                 | +0.005/-0.000 | 2.023               | /      |        |                         |          |
|        | 2.079                                 | +0.005/-0.000 | 2.084               | /      |        |                         |          |
|        | 2.145                                 | +0.005/-0.000 | 2.150               | /      |        |                         |          |
|        | 2.209                                 | +0.005/-0.000 | 2.214               | /      |        |                         |          |
|        | 2.287                                 | +0.005/-0.000 | 2.292               | /      |        |                         |          |
|        | 2.363                                 | +0.005/-0.000 | 2.367               | /      |        |                         |          |
|        | 2.433                                 | +0.005/-0.000 | 2.436               | /      |        |                         |          |
|        | 0.200                                 | +/-0.010      | 0.200               | /      |        |                         |          |
|        | 0.500 x 30°                           | +/-0.010      | 0.500 x 30°         | /      |        |                         |          |
|        | R0.063                                | +/-0.010      | R0.063              | /      |        |                         |          |
|        | R0.500                                | +/-0.010      | R0.500              | /      |        |                         |          |
|        | 4.438                                 | +/-0.030      | 4.438               | /      |        |                         |          |

|                          |                       |                     |     |
|--------------------------|-----------------------|---------------------|-----|
| Measured by: <u>A.M.</u> | Audited by: <u>MB</u> | Prototype Approval: | N/A |
| Date: <u>10.05.05</u>    | Date: <u>10-05-06</u> | Date:               | N/A |

| Rev | Date     | Change                       | Revised by | Approved           |
|-----|----------|------------------------------|------------|--------------------|
| A   | 06.09.01 | New Issue (P/O D206-667-203) | KJ/JLM     | <u>[Signature]</u> |



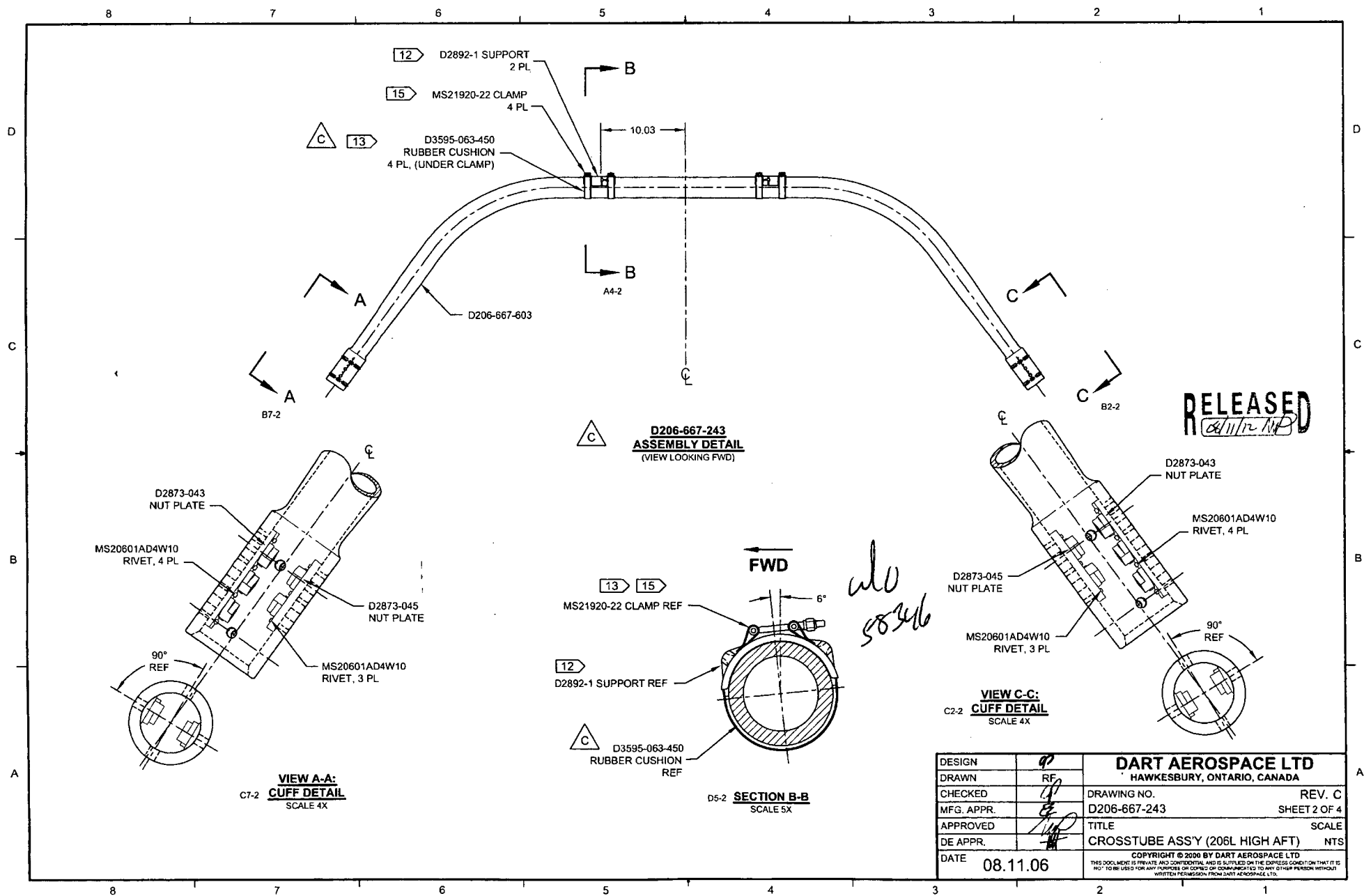
| Item | Qty<br>-243 | Part Number    | Description  |
|------|-------------|----------------|--|
| 1    | X           | D206-667-243   | CROSSTUBE ASSEMBLY (206L HIGH AFT)   |
| 2    | 1           | D6004-115      | CROSSTUBE  |
| 3    | 2           | D2873-043      | NUT PLATE  |
| 4    | 2           | D2873-045      | NUT PLATE  |
| 5    | 2           | D2892-1        | SUPPORT  |
| 6    | 4           | D3595-063-450  | RUBBER CUSHION   |
| 7    | 4           | MS21920-22     | CLAMP  |
| 8    | 14          | MS20601AD4W10  | RIVET (OR NAS9302B 4-10)   |
| 9    | A/R         | MAGNOBOND 6398 | ROCKWELL SPECIFICATION RBO-120-023<br>ADHESIVE (TEXTRON/BELL SPEC. 299-<br>947-100, TYPE II, CLASS 2 ADHESIVE) |

#### GENERAL NOTES:

- 1) MATERIAL: MANUFACTURED FROM D6004-115  
FINISHED LENGTH = 104.91±0.020
- 2) FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1  
PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2  
PAINT OUTSIDE PER DART QSI 005 4.2
- 3) TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED.
- 4) UNITS: INCHES UNLESS OTHERWISE NOTED.
- 5) BREAK SHARP EDGES: 0.005 TO 0.010 MAX.
- 6) IDENTIFICATION: SCRIBE DART PART NUMBER "D206-667-243" AND BATCH NUMBER ON INSIDE OF CUFF USING VIBRATING STYLUS.
- 7) WEIGHT: 21.9 lbs
- 8) PART IS SYMMETRIC ABOUT CENTERLINE.
- 9) RUN CUTTER OFF PART WHERE INDICATED. BLEND OUT EDGE LONGITUDINALLY, TRANSITION SHOULD BE SMOOTH.
- 10) BEND PROGRESSIVELY WITH A MINIMUM OF 8 PASSES. MAXIMUM TUBE FLATTENING DUE TO BENDING IS 6% BASED ON O.D.
- 11) LIQUID PENETRANT INSPECT OUTSIDE SURFACE OF CROSSTUBE PER QSI 038.
- 12) INSTALL D2892-1 SUPPORT USING 0.03" TO 0.06" THICK LAYER OF MAGNOBOND 6398 PER QSI 015. LET CURE FOR 12 HOURS AFTER INSTALLATION AND PRIOR TO PACKAGING.
- 13) INSTALL MS21920-22 CLAMPS WITH D3595-063-450 RUBBER CUSHIONS TO SECURE THE D2892-1 SUPPORT ON TOP SIDE OF THE CROSSTUBE. ENSURE CLAMP MECHANISMS ARE LOCATED ON CROSSTUBE SUPPORTS.
- 14) EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE. THE OUTSIDE SURFACE MUST BE SMOOTH AND FREE FROM SURFACE DEFECTS SUCH AS SCRATCHES, NICKS, OR DENTS. DEFECTS UP TO 0.005" MAY BE BLENDED OUT LONGITUDINALLY. CIRCUMFERENTIAL GRIND MARKS ARE UNACCEPTABLE.
- 15) TORQUE CLAMPS 80 TO 100 IN-LB. ENSURE AT LEAST 1.5 THREADS ARE SHOWING IN SAFETY AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING.

RELEASED  
08/11/06

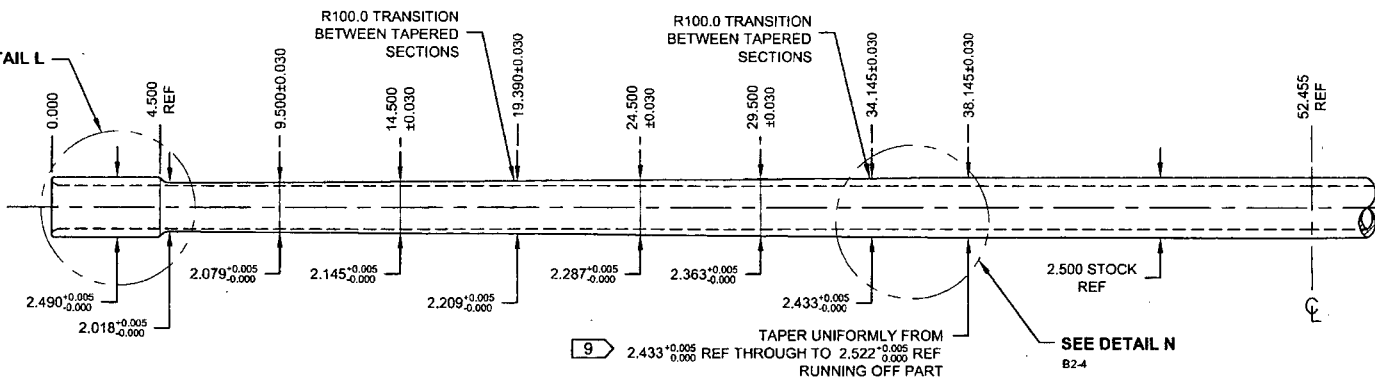
|            |   |  |              |
|------------|---|--|--------------|
| C          | REVISE GENERAL NOTES/PART LIST (ZN D7-1); REORGANIZED VIEWS AND REFORMATTED DRAWING TO CURRENT STANDARDS. D3595-063-450 WAS D2856-400-773 (ZN D6-2 & A5-2); REMOVED REF. & ADD TOLERANCES (ZN 4-3, C5-3, D3-3); RELOCATED FLAG #6 (ZN A8-3) PER NCR 210; MOVED TURNING DETAIL & UPDATED TOLERANCE TO SHEET 4. | RF   | 08.11.06     |
| B          | ADD HOLES AND NUT PLATES FOR COMPATABILITY WITH BHTAA SKUDTUBES   | PH   | 05.07.26     |
| A          | NEW ISSUE   | CP   | 00.11.17     |
| REV.       | DESCRIPTION   | BY   | DATE         |
| DESIGN     | RF  | DART AEROSPACE LTD<br>HAWKESBURY, ONTARIO, CANADA  |              |
| DRAWN      | RF  | DRAWING NO.  | REV. C       |
| CHECKED    | RF  | D206-667-243   | SHEET 1 OF 4 |
| MFG. APPR. | RF  | TITLE  | SCALE        |
| APPROVED   | RF  | CROSSTUBE ASS'Y (206L HIGH AFT)  | NTS          |
| DE APPR.   | RF  | COPYRIGHT © 2006 BY DART AEROSPACE LTD<br>THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD. |              |
| DATE       | 08.11.06  |  |              |



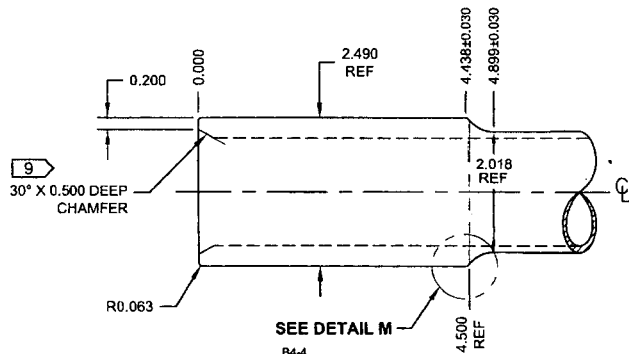
|            |          |   |              |
|------------|----------|---|--------------|
| DESIGN     | RF       | <b>DART AEROSPACE LTD</b>   |              |
| DRAWN      | RF       | HAWKESBURY, ONTARIO, CANADA   |              |
| CHECKED    | RF       | DRAWING NO.   | REV. C       |
| MFG. APPR. | RF       | D206-667-243  | SHEET 2 OF 4 |
| APPROVED   | RF       | TITLE   | SCALE        |
| DE APPR.   | RF       | CROSSTUBE ASS'Y (206L HIGH AFT)   | NTS          |
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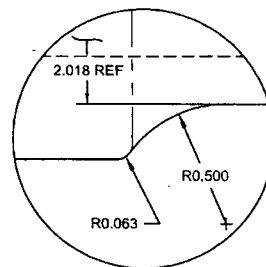
SEE DETAIL L  
B7-4



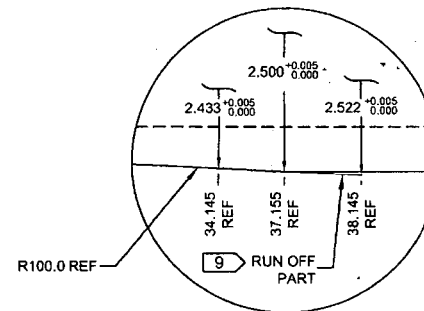
**TURNING DETAIL**



**DETAIL L: CROSTUBE CUFF**  
NOT TO SCALE



**DETAIL M: CUFF TRANSITION**  
NOT TO SCALE



**DETAIL N: TAPER RUN-OFF**  
NOT TO SCALE

**RELEASED**

|   |          |  |              |
|---|----------|--|--------------|
| DESIGN  | 90       | <b>DART AEROSPACE LTD</b>              |              |
| DRAWN   | RF       | HAWKESBURY, ONTARIO, CANADA            |              |
| CHECKED   | CP       | DRAWING NO.                            | REV. C       |
| MFG. APPR.  | EP       | D206-667-243                           | SHEET 4 OF 4 |
| APPROVED  | EP       | TITLE                                  | SCALE        |
| DE APPR.  | EP       | CROSTUBE ASS'Y (206L HIGH AFT)         | NTS          |
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